

CLAIMS

What is claimed is:

1. A device for producing hydrogen, comprising:
a container housing a water-based solution and a metal constituent; and
a generator that ultrasonically irradiates said water-based solution in the presence of said metal constituent to produce hydrogen gas.
2. The device of claim 1 wherein said water-based solution is liquid water.
3. The device of claim 1 wherein said generator ultrasonically irradiates said water-based solution and said metal constituent.
4. The device of claim 1 wherein said metal constituent comprises a plurality of metal particles.
5. The device of claim 4 wherein said water-based solution and said metal constituent constitute a heterogeneous mixture.
6. The device of claim 1 wherein said metal constituent comprises at least one metal plate.
7. The device of claim 1 wherein said metal constituent coats an interior surface of said container.

8. The device of claim 1 wherein said generator is housed in said container.
9. The device of claim 1 wherein said container comprises a head space that retains said hydrogen gas.
10. The device of claim 1 further comprising a compressor that extracts said hydrogen gas from said container.
11. The device of claim 1 wherein said metal constituent comprises at least one selected from the group consisting of aluminum (Al), magnesium (Mg), iron (Fe) and Zinc (Zn).
12. The device of claim 1 wherein said metal constituent comprises at least one selected from the group consisting of aluminum (Al), alloys of Al, magnesium (Mg), alloys of Mg, iron (Fe), alloys of Fe, zinc (Zn) and alloys of Zn.

13. A power supply system that processes hydrogen to produce power, comprising:

a container housing a water-based solution and a metal constituent;

a generator that ultrasonically irradiates said water-based solution in the presence of said metal constituent to produce hydrogen gas; and

a power plant that consumes said hydrogen gas to produce a power output.

14. The power supply system of claim 13 wherein said water-based solution is liquid water.

15. The power supply system of claim 13 wherein said metal constituent comprises a plurality of metal particles.

16. The power supply system of claim 15 wherein said water-based solution and said metal constituent constitute a heterogeneous mixture.

17. The power supply system of claim 13 wherein said metal constituent comprises at least one metal plate.

18. The power supply system of claim 13 wherein said power plant is an engine that produces drive torque.

19. The power supply system of claim 13 wherein said power plant is a fuel cell that produces electrical power.

20. The power supply system of claim 13 further comprising a supply unit with an inlet in fluid communication with said container and an outlet in fluid communication with said power plant.

21. The power supply system of claim 20 wherein said supply unit comprises a compressor that extracts said hydrogen gas from said container.

22. The power supply system of claim 13 wherein said hydrogen gas is produced at a pressure directly consumable by the power plant.

23. The power supply system of claim 13 wherein said generator is housed in said container.

24. The power supply system of claim 13 wherein said container comprises a head space that retains said hydrogen gas.

25. The power supply system of claim 13 wherein said metal constituent comprises at least one selected from the group consisting of aluminum (Al), magnesium (Mg), iron (Fe) and Zinc (Zn).

26. The power supply system of claim 13 wherein said metal constituent comprises at least one selected from the group consisting of aluminum (Al), alloys of Al, magnesium (Mg), alloys of Mg, iron (Fe), alloys of Fe, zinc (Zn) and alloys of Zn.

27. A method of producing power using hydrogen, comprising:
- applying ultrasonic irradiation to a water-based solution in the presence of a metal constituent to produce hydrogen gas;
- collecting said hydrogen gas; and
- processing said hydrogen gas within a power plant to produce a power output.
28. The method of claim 27 wherein said water-based solution is liquid water.
29. The method of claim 27 further comprising combining said metal constituent and said water-based solution before said step of applying.
30. The method of claim 27 wherein said metal constituent comprises a plurality of metal particles.
31. The method of claim 27 wherein said water-based solution and said metal constituent comprise a heterogeneous mixture.
32. The method of claim 27 wherein said metal constituent comprises at least one metal plate.
33. The method of claim 27 wherein said power plant is an engine that produces drive torque.

34. The method of claim 27 wherein said power plant is a fuel cell that produces electrical power.

35. The method of claim 27 further comprising compressing said hydrogen gas to supply said hydrogen gas to said power plant at a desired pressure.

36. The method of claim 27 wherein said hydrogen gas is produced at a pressure directly usable in said power plant.

37. The method of claim 27 wherein said metal constituent comprises at least one selected from the group consisting of aluminum (Al), magnesium (Mg), iron (Fe) and Zinc (Zn).

38. The method of claim 27 wherein said metal constituent comprises at least one selected from the group consisting of aluminum (Al), alloys of Al, magnesium (Mg), alloys of Mg, iron (Fe), alloys of Fe, zinc (Zn) and alloys of Zn.